

§103(a) as being unpatentable over Asakura '664 (US Patent No. 5,730,664).

Claims 1, 2, and 5-14 are rejected under 35 USC §102(b) as being anticipated by, or in the alternative, under 35 USC §103(a) as being unpatentable over Moriyama '802 (US Patent No. 5,713,802).

Claims 1, 2, and 5-14 are rejected under 35 USC §103(a) as being unpatentable over Moriyama '802 in view of Tanaka '663 (US Patent No. 5,730,663).

Claims 1-14 are rejected under 35 USC §103(a) as being unpatentable over Moriyama '856 (US Patent No. 5,697,856) in view of Sullivan '356 (US Patent No. 6,015,356).

These rejections are traversed for the following reasons.

#### **Present Invention**

The present invention is directed to a three-piece solid golf ball which includes the following features: (1) a core having a JIS-C surface hardness of 65-83 and a deformation of 0.8 - 5.3 mm; (2) an intermediate layer having a Shore D hardness of 63-70; (3) a cover having a Shore D hardness of 45-62; and (4) a difference in the hardness of the intermediate

layer and cover being within the range of 3-20. Use of these features results in advantageous properties as evidenced by the comparative test results summarized in Tables 1-7 at pages 17-28 of the specification. Specifically, Tables 4-7 at pages 24-27 show that Examples 1-6 (present invention) exhibit advantageously improved flight distance (carry), shot feel and controllability properties over Comparative Examples 1-8. Note, for example, that if the core hardness varies over a large range or if the hardness properties of each of the cover/intermediate layer/core falls outside the cited ranges, then disadvantageous inferior properties result.

#### **Disclosure of Azakura '664**

Azakura '664 discloses a solid golf ball that comprises a core (1) and a cover formed on the core, the cover having a two-layer cover structure of an inner cover layer (2) and an outer cover layer (3), wherein the core (1) is obtained from a rubber composition comprising 100 parts by weight of a base rubber and 18 to 28 parts by weight of a metal salt of an unsaturated carboxylic acid and the inner cover layer (2) has a specific gravity of 1.2 to 1.5, a thickness of 0.5 to 2.0 mm and a Shore D hardness within the range of more than that of the outer cover layer (3) and not more than 80 and, the outer cover layer (3)

has a specific gravity of 0.5 to less than 1.2, a thickness of 1.0 to 2.5 mm and a Shore D hardness of 63 to 73.

**Disclosure of Moriyama '802**

Moriyama '802 discloses a golf ball having a two-layer cover structure with a hard inner layer and a soft outer layer. The golf ball of Moriyama '802 comprises a core (1) and a cover formed on the core, wherein the cover has a two-layer cover structure of a hard inner cover layer (2) and a soft outer cover layer (3), and the inner cover layer (2) comprises a high-rigid polyamide resin present in an amount of not less than 5% by weight based on the total weight of the inner cover components.

**Disclosure of Tanaka '663**

Tanaka '663 discloses a solid golf ball which comprises a core and a cover covering the core, wherein the core has a diameter of 32.7 to 38.4 mm and a change of deformation, formed by applying to the core an initial load of 10 kg to a final load of 130 kg, of 3.5 to 6.5 mm. The cover consists of an inner layer and an outer layer in which the inner layer has a stiffness modulus of 3,500 to 6,000 kgf/cm<sup>2</sup> and a thickness of 1.1 to 2.5 mm and the outer layer has a stiffness modulus of 3,000 to 5,500 kgf/cm<sup>2</sup>, which is at least 500 kgf/cm<sup>2</sup> lower than that of the inner layer, and a thickness of 1.1 to 2.5 mm, and

both the inner layer and outer layer are made of a resinous composition compound mainly of an ionomer resin.

**Disclosure of Moriyama '856**

Moriyama '856 discloses a solid golf ball comprising a core and a cover, wherein the core has a trans structure content in polybutadiene of 10 to 30%. The core is produced by vulcanizing a rubber composition containing a butadiene rubber having cis structure content of not less than 90% before vulcanization, as a base rubber, wherein an amount of trans structure after vulcanization is 10 to 30% and a difference in hardness measured by a JIS-C type hardness tester between the center of the core and each point located from the center to the surface at an interval of 5 mm is not more than 10%. The rubber composition for forming the core comprises a vulcanizing agent, a filler, an organic peroxide and an organophosphorus compound, in addition to the butadiene rubber having cis structure content of not less than 90% before vulcanization.

**Disclosure of Sullivan '356**

Sullivan '356 discloses a multi-layer golf ball compositions having a core, an inner cover and an outer cover producing regulation balls. A smaller and lighter core is produced and metal particles, or other heavy weight filler

materials, are included in the inner cover compositions. The heavy weight filler particles, such as powdered metals, are included in a relatively thick inner cover layer (or mantle) formed from an ionomer resin of a solid, three-piece multi-layered golf ball. The size and weight of the core can thereby be reduced in order to produce an overall golf ball which meets, or is less than, the 1.62 ounce maximum weight limitation specified by the United States Golf Association. It has been found that the combination of the present invention produces a golf ball with an increased moment of inertia and/or a greater radius of gyration and thus generates lower spin due to the increased weight of the inner cover layer.

Removal of Asakura '664, Moriyama '802, Tanaka '663, Moriyama '856, and Sullivan '356

The Examiner asserts that Asakura '664 discloses a three-piece golf ball that has a soft outer cover and a harder filled inner core. However, it is noted that Figure 1 in Asakura '664 discloses a shore D hardness of the Outer Cover Layer between 63 and 73. This is outside of the claimed range in claim 1 (45-62).

The Applicants have further performed experiments to show that the cores of the Asakura '664, the Moriyama '802, and Moriyama '856 references have JIS-C hardness differences within

the cores that are larger than 5. Accordingly, these experiments prove that the reference does not inherently have the required JIS-C hardness as the Examiner had asserted. If the hardness distribution is broader than the claimed range in the instant invention (as appears in the Asakura '664, the Moriyama '802, and Moriyama '856 references), the resulting golf ball shows poor rebound characteristics and shorter flight distance. These poor rebound characteristics and shorter flight distance can be seen in comparative Examples 2 and 3 in the instant written description (see Table 7).

#### Experimental Results

Core I for C5 of Table 3 of the Asakura '664 reference and the core of the Moriyama '802 were prepared and subjected to a measurement of JIS-C hardness and deformation amount.

The formulation shown in the below Table 1 were kneaded and vulcanized in a spherical mold to obtain a core. The vulcanization condition was conducted in two stages as is described in Table 1. The results of the measurement are as shown in the below Table 1.

Table 1.

	Comparative Example 5 from the Asakura reference	Moriyama '802 reference
Ingredients		
Cis-1,4-polybutadiene	100	100
Zinc Acrylate	22	26
Zinc Oxide	17.6	29.9
Antioxidant	0.5	0.5
Dicumyl peroxide	1.6	2.0
Diphenyl disulfide	0.5	-
Balnoc R	-	0.5
Vulcanization conditions	140°C X 16 minutes + 165°C X 8 minutes	145°C X 30 minutes
Core Diameter (mm)	35.1	35.5
Deformation amount (10K-130K)	4.9	4.2
Hardness (JIS-C)		
Center	60	68
5 mm from the center	64	71
10 mm from the center	67	73
15 mm from the center	70	77
Surface	70	75
Hardness difference	<u>10</u>	<u>9</u>

The above Table 1 shows that the cores of the Azakura '664 and Moriyama '802 references have hardness differences outside the range of the present invention. The instant claim 1 states that "a JIS-C hardness of the core is essentially uniform from its center to surface". This is not the case with the Azakura '664 and Moriyama '802 references (as is seen in Table 1 above). Thus, the rejection of claims 1-6 and 8-10 over Asakura '664 can not stand nor can the rejection of claims 1, 2, and 5-14 over Moriyama '802 because they fail to disclose the elements of the instant invention. Withdrawal of both of these rejections is not only warranted, it is also respectfully requested.

The rejection of claims 1, 2 and 5-14 over Moriyama '802 in view of Tanaka '663 also is inapposite. As was disclosed in the specification on page 3, Tanaka '663 fails to disclose an outer cover layer which has the hardness properties falling within the range of the cover layer of the golf ball of the instant invention. This failure in hardness properties leads to shorter flight distances than is disclosed in the golf ball of the present invention. Because the disclosure of Moriyama '802 also does not recognize the advantageously superior flight distance of the instant invention, the two references combined do not arrive at the instant invention. Withdrawal of this rejection is respectfully requested.

With respect to the rejection of claims 1-14 over Sullivan '356 in view of Moriyama '856, it is submitted that this rejection is also inappropriate. Sullivan '356 fails to disclose a golf ball with a cover layer having a Shore D hardness within the range of the golf ball of the present invention. Thus, Sullivan '356 fails to recognize the advantages achieved by the golf ball of the present invention as evidenced by the Comparative test results discussed above. Therefore, significant patentable distinctions exist between the present invention and Sullivan '356.

Even if Moriyama '856 is hypothetically combined with Sullivan '356, the resulting hypothetical combined disclosure



would still fail to include all of the hardness properties for the core/intermediate layer/cover golf ball structure of the present invention. Consequently, the Examiner has failed to make out a *prima facie* case of obviousness with regard to the 35 USC §103(a) rejection over Moriyama '856 in view of Sullivan '356. Three criteria must be met to make out a *prima facie* case of obviousness.

- 1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.
- 2) There must be a reasonable expectation of success
- 3) the prior art reference (or references when combined) must teach or suggest all the claim limitations.

See MPEP §2142 and *In re Vaeck*, 20 USPQ2d 1438 (CAFC, 1991). In particular, the Examiner has failed to meet the third element to make a *prima facie* obviousness rejection. The Moriyama '856 reference hypothetically combined with the Sullivan '356 reference, fails to include all of the hardness properties for the core/intermediate layer/cover golf ball structure of the present invention. Thus, this rejection must also be withdrawn. Withdrawal is respectfully requested.

With the above remarks, it is believed that the claims, as they now stand, define patentable subject matter such that a

passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.


If any questions remain regarding the above matters, please contact Applicant's representative, Andrew D. Meikle, in the Washington metropolitan area at the phone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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